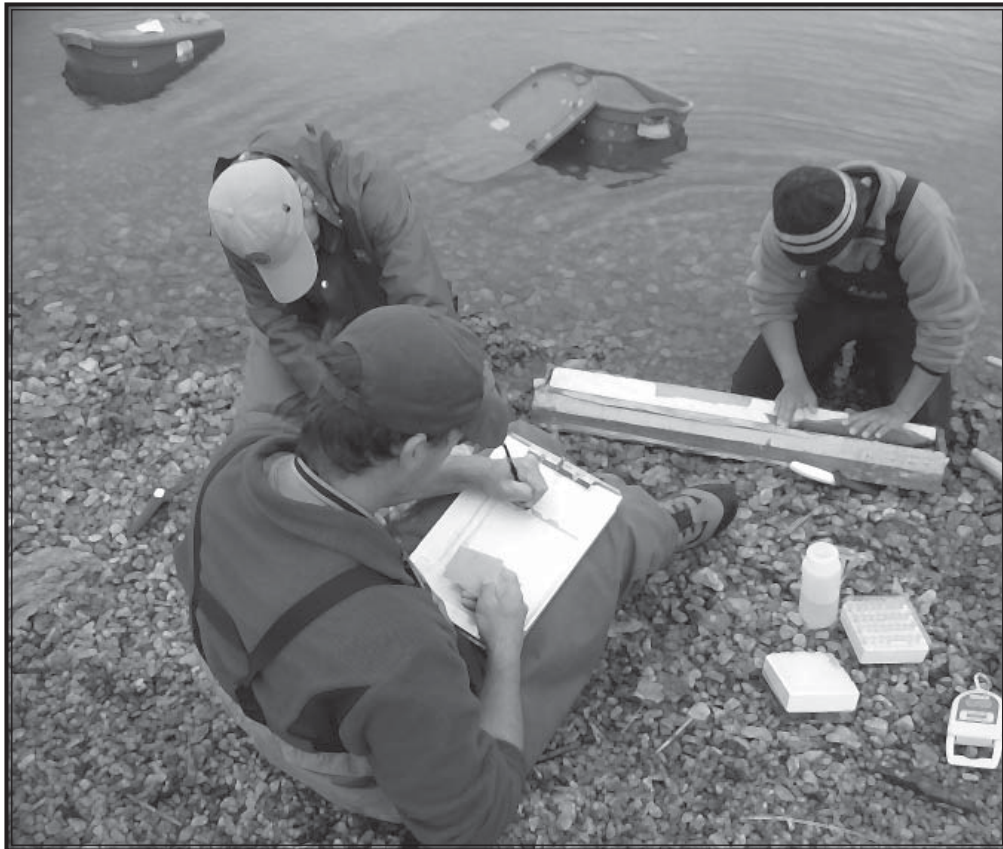


DRAFT
2007
FISHERIES RESOURCE MONITORING PLAN



INTRODUCTION

BACKGROUND

Since 1999, under the authority of Title VIII of ANILCA, the Federal government has assumed management responsibility for subsistence fisheries on Federal public lands in Alaska. Expanded subsistence fisheries management has imposed substantial new informational needs for the Federal system. Section 812 of ANILCA directs the Departments of Interior and Agriculture, cooperating with the State of Alaska and other Federal agencies, to research fish and wildlife and subsistence uses on Federal public lands. To increase the quantity and quality of information available for management of subsistence fisheries, the Fisheries Resource Monitoring Program (Monitoring Program) was created within the Office of Subsistence Management. The Monitoring Program was envisioned as a collaborative inter-agency, inter-disciplinary approach to enhance existing fisheries research, and effectively communicate information needed for subsistence fisheries management on Federal public lands.

Original guidance for the Monitoring Program was provided by the Federal Subsistence Board and outlined in the *Operational Strategy for Information Management*¹. The Regional Advisory Councils (Councils) have identified important issues and information needs for their regions, with review and update on an annual basis. To ensure that the Monitoring Program addresses the highest priority information needs for Federal subsistence fisheries management, the Office of Subsistence Management began a strategic planning process in 2004 to build on the work done by the Councils. Facilitated workshops for the Southwest, Southcentral, and Southeast regions have been held over the last three years with representatives of Federal and State agencies, academia, Alaska Native and rural organizations, and Councils. Participants at each workshop identified fisheries units for their region; developed goals, objectives, and information needs for each fishery unit; and then prioritized fishery units, goals, objectives and information needs. Final workshop reports for the Southcentral region and Bristol Bay-Chignik area have been completed, and results were used to guide the 2007 Request for Proposals. The Kodiak-Aleutians report should be completed by November 2006, the first workshop for the Northern Alaska Region is tentatively scheduled for spring 2007, and plans for the remaining regions should be completed within three years.

The mission of the Monitoring Program is to identify and provide information needed to sustain subsistence fisheries on Federal public lands, for rural Alaskans, through a multidisciplinary, collaborative program.

To implement the Monitoring Program, a collaborative approach is utilized where five Federal agencies (Fish and Wildlife Service, Bureau of Land Management, National Park Service, Bureau of Indian Affairs, and USDA Forest Service) work with the Alaska Department of Fish and Game, Regional Advisory Councils, Alaska Native organizations, and other organizations. An inter-agency Technical Review Committee provides scientific evaluation of proposals and investigation plans. Public review and recommendations for funding are provided through the Councils. An inter-agency Staff Committee reviews all recommendations, and reconciles differences between staff and public recommendations. The Federal Subsistence Board (Board) approves annual monitoring plans with the benefit of both a technical recommendation by the Technical Review Committee and public review by the Regional Advisory Councils.

¹ Krueger, C., Brelsford, T., Casipit, C., Harper, K., Hildebrand, I., Rost, P., Thompson, K., and Jones, L. 1999. *Federal Subsistence Fisheries Management: Operational Strategy for Information Management. Report to the Federal Subsistence Staff Committee by the Sub-Committee for the Development of a Blueprint for Interagency Functions, Roles, and Responsibilities.* 122 p.

The purpose of this section is to present the Technical Review Committee's funding recommendations for the 2007 Monitoring Plan.

PROJECT EVALUATION PROCESS

The Technical Review Committee evaluates proposals, and subsequently full investigation plans, and makes recommendations for funding. The committee is chaired by the Chief of the Office of Subsistence Management Fisheries Information Services Division, and is composed of representatives from each of the five Federal agencies and three representatives from the Alaska Department of Fish and Game. An additional anthropologist from the Minerals Management Service provides additional social science expertise on the Technical Review Committee and provides a balance of disciplines. Staff from Fisheries Information Services provides support for the committee.

Four factors are used to evaluate studies:

1. Strategic Priority

Proposed projects should address the following and must meet the first criteria to be eligible for Federal subsistence funding.

Federal Jurisdiction—Issue or information needs addressed in projects must have a direct association to a subsistence fishery within a Federal conservation unit as defined in legislation, regulation and plans.

Conservation Mandate—Risk to the conservation of species and populations that support subsistence fisheries, and risk to conservation unit purposes as defined in legislation, regulation and plans.

Allocation Priority—Risk of failure to provide a priority to subsistence uses, and risk that subsistence harvest needs will not be met.

Data Gaps—Amount of information available to support subsistence management (higher priority given where a lack of information exists).

Role of Resource—Contribution of a species to a subsistence harvest (e.g., number of villages affected, pounds of fish harvested, miles of river) and qualitative significance (e.g., cultural value, unique seasonal role).

Local Concern—Level of user concerns over subsistence harvests (e.g., upstream vs. downstream allocation, effects of recreational use, changes in fish abundance and population characteristics).

2. Technical-Scientific Merit

The project must meet accepted standards for design, information collection, compilation, analysis, and reporting. Projects should have clear study objectives, an appropriate sampling design, correct statistical analysis, a realistic schedule and budget, and appropriate products, including written reports. Projects must not duplicate work already being done.

3. Investigator Ability and Resources

Investigators must have the ability and resources to successfully complete the proposed study. This will be evaluated using the following information for each investigator:

Ability

- Education and training
- Related work experience
- Publications, reports, and presentations
- Past or ongoing work on Monitoring Program studies

Resources

- Office and laboratory facilities
- Technical and logistic support
- Personnel and budget administration

4. Partnership-Capacity Building

Partnerships and capacity building are priorities of the Monitoring Program. ANILCA mandates that the Federal government provide rural residents a meaningful role in the management of subsistence fisheries, and the Monitoring Program offers tremendous opportunities for partnerships and participation of local residents in monitoring and research. Investigators are requested to include a strategy for integrating local capacity development in their investigation plans. Investigators must complete appropriate consultations with local villages and communities in the area where the project is to be conducted. Letters of support from local organizations add to the strength of a proposal. Investigators and their organizations should demonstrate their ability to maintain effective local relationships and commitment to capacity building.

POLICY AND FUNDING GUIDELINES

Several policies have been developed to aid in implementing funding.

- Studies must be non-duplicative with existing projects.
- Most Monitoring Program funding is dedicated to non-Federal sources.
- Activities not eligible for funding under the Monitoring Program include: a) habitat protection, restoration, and enhancement; b) hatchery propagation, restoration, enhancement, and supplementation; c) contaminant assessment, evaluation, and monitoring; and d) projects where the primary objective is capacity building (e.g., science camps, technician training, intern programs). These activities would most appropriately be addressed by the land management agencies.
- Proposals may be funded for up to three years duration.

Finances and Guideline Model for Funding

The Monitoring Program was first implemented in 2000, with an initial investment of \$5 million. Since 2001, a total of \$6.25 million is annually allocated for the Monitoring Program. The Department of Interior, through the U.S. Fish and Wildlife Service, annually provides \$4.25 million. The Department of Agriculture, through the U.S. Forest Service, annually provides \$2 million. On an annual basis, this budget funds both continuations of existing studies (year-2 or 3 of multi-year projects), and new study starts. Budget guidelines are established by geographic region and data type, and for 2007, \$3.97 million is available for new starts. Proposals are solicited according to the following two data types.

1. Stock Status and Trends Studies (SST).

These projects address abundance, composition, timing, behavior, or status of fish populations that sustain subsistence fisheries with nexus to Federal public lands. The budget guideline for this category is two-thirds of available funding.

2. Harvest Monitoring and Traditional Ecological Knowledge (HM-TEK).

These projects address assessment of subsistence fisheries including quantification of harvest and effort, and description and assessment of fishing and use patterns. The budget guideline for this category is one-third of available funding.

2007 FISHERIES RESOURCE MONITORING PLAN

For 2007, a total of 37 investigation plans are under consideration for funding (Table 1). Of these, 30 are SST projects and 7 are HM-TEK projects. The Technical Review Committee recommends funding 35 of these investigation plans.

Total funding available for new projects in 2007 is \$3.97 million while the proposed cost of funding all 37 projects submitted would be \$4.04 million. The 35 projects recommended for funding by the Technical Review Committee would have a total cost of \$3.80 million. In making their recommendations, the committee also weighed the importance of funding new projects in 2007 with the knowledge that only about \$2.2 million will be available for new projects in 2008. As has been done in past years, any unallocated Monitoring Program funds from the current year will be used to increase the amount of funding available for the subsequent year.

As recommended by the Technical Review Committee, the 2007 Monitoring Plan would provide 35% of the funding to Alaska Native organizations, 28% to Federal agencies, and 33% to State agencies (Figure 1).

Table 1. Number of investigation plans received for funding consideration in 2007, and number recommended for funding by the Technical Review Committee. Data types are stock status and trends (SST), and harvest monitoring and traditional ecological knowledge (HM-TEK).

Geographic Region	Investigation Plans			Technical Review Committee		
	SST	HM-TEK	Total	SST	HM-TEK	Total
Northern Alaska	3	1	4	3	1	4
Yukon	5	3	8	5	2	7
Kuskokwim	6	0	6	6	0	6
Southwest Alaska	5	2	7	5	1	6
Southcentral Alaska	4	0	4	4	0	4
Southeast Alaska	7	1	8	7	1	8
Total	30	7	37	30	5	35

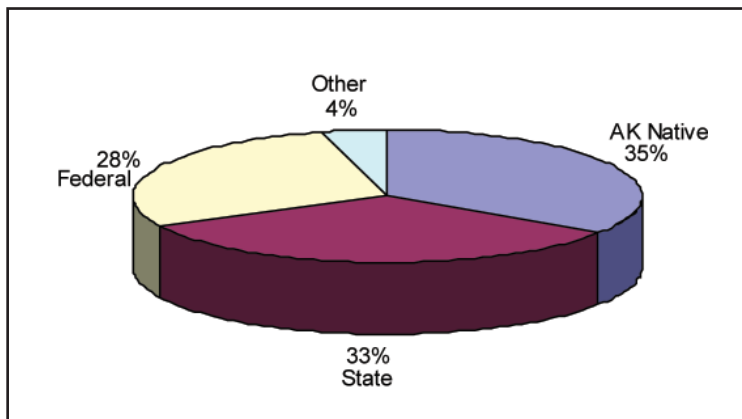


Figure 1. Distribution of 2007 funding to Alaska Native, Federal, State, and other organizations.

HOW TO PROVIDE YOUR COMMENTS

We invite your review and comments on the draft Fisheries Resource Monitoring Plan for 2007. Regional Advisory Councils will have an opportunity to review the draft Monitoring Plan during Council meetings in the fall of 2006.

Your comments are welcome by October 20, 2006. These will be compiled along with Council comments and will be presented to the Federal Subsistence Board when it meets in January 2007. Written comments may be submitted to:

Office of Subsistence Management
Attn: Kathy Orzechowski
3601 C Street, Suite 1030
Anchorage, AK 99503
Phone: 1-800-478-1456 Fax: 907-786-3612
E-mail: fisheries_resource_monitoring@fws.gov

YUKON REGION OVERVIEW

ISSUES AND INFORMATION NEEDS

The three Yukon River Regional Advisory Councils (Yukon-Kuskokwim Delta, Western Interior, and Eastern Interior) have identified many issues and information needs for the region, with review and update on an annual basis. The three Councils generally identified Chinook and chum salmon as the highest priority species, and non-salmon species and collection and analysis of traditional knowledge have also been identified as important information needs.

The U.S. and Canada Yukon River Salmon Joint Technical Committee Plan was completed in March 2005. A subsequent meeting in November 2005 between State and Federal managers, non-government organizations and natural resource management agencies used the plan to evaluate and prioritize salmon monitoring projects in Alaska. Priorities identified in the meeting (developed through application of the Joint Technical Committee Plan) were used to evaluate the strategic priorities of the Yukon River salmon stock status and trends (SST) proposals submitted for 2007.

PROJECTS CURRENTLY FUNDED UNDER THE FISHERIES RESOURCE MONITORING PROGRAM

Since the inception of the Monitoring Program in 2000, 70 projects have been funded in the Yukon Region, and six of these will still be operating in 2006 (Table 1). Many of the projects are continuation projects, but since projects are only funded up to three years, each project is treated as a distinct entity and is evaluated on its merits after three years. Most (54) of the projects have been directed at salmon, and 16 projects have addressed resident fish species such as whitefish and northern pike.

PROJECTS FORWARDED FOR INVESTIGATION PLAN DEVELOPMENT

The Technical Review Committee forwarded eight projects for investigation plan development, including six SST projects and two HM-TEK projects. The investigators for one of the SST proposals declined to submit an investigation plan, and one HM-TEK proposal was moved from the Inter-regional category to the Yukon Region after the investigator revised the investigation plan to focus solely on the Yukon Region. Of the eight projects under consideration in 2007, six focus on salmon, one on sheefish, and one on non-salmon.

Investigators used Technical Review Committee proposal review comments, and sometimes worked with Office of Subsistence Management staff to develop investigation plans. Detailed budgets submitted with each investigation plan allowed identification of funds requested by Alaska Native, State, Federal, and other organizations; funds that would be used to hire local residents; and matching funds from investigators (Tables 2 and 3).

AVAILABLE FUNDS

Federal Subsistence Board guidelines direct initial distribution of funds among regions and data types. For 2007, \$778,000 is available for funding new projects in the Yukon region; this includes \$519,000 for

Table 1. Summary of projects funded under the Fisheries Resource Monitoring Program in the Yukon Region, 2000–2007. Abbreviations used for investigators are: ADFG=Alaska Department of Fish and Game, AVCP=Association of Village Council Presidents, AV= Arctic Village, BF=Bill Firris, BLM=Bureau of Land Management, BSFA=Bering Sea Fisherman's Association, CATG=Council of Athabaskan Governments, CK=City of Kaltag, DFO=Department of Fisheries and Oceans, EMV= Emmonak Village Council, NPS=National Park Service, NVE=Native Village of Eagle, NVHB= Native Village of Hooper Bay, NVV=Native Village of Venetie, RN=Research North, SVNRC= Stevens Village Natural Resource Office, SZ=Stan Zuray, UAF=University of Alaska Fairbanks, TCC=Tanana Chiefs Conference, TTC=Tanana Tribal Council, UAF=University of Alaska Fairbanks, USFWS=U.S.Fish and Wildlife Service, USGS=U.S.Geological Survey, UW=University of Washington, YRDFA=Yukon River Drainage Fisheries Association.

Title	Investigators	Budget (\$000s)							
		2000	2001	2002	2003	2004	2005	2006	2007
Yukon River Salmon Projects									
Effects of <i>Ichthyophonus</i> in Chinook Salmon	UW	\$83.3							
Tanana Upper Kantishna River Fish Wheel	NPS	\$11.5	\$11.5						
Pilot Station Sonar Upgrade	ADFG	\$148.9	\$162.9						
Hooper Bay Test Fishing	ADFG, NVHB	\$30.0	\$27.5	\$31.5	\$26.3				
Pilot Station Sonar Technician Support	AV/CP	\$14.8							
Henshaw Creek Salmon Weir	USFWS	\$60.0	\$60.0	\$60.0	\$73.9				
TEK Salmon and Other Fish in Circle and Eagle	NVE	\$30.0							
Yukon River Salmon Management Teleconferences	YRDFA			\$5.0	\$5.0				
Yukon River Salmon TEK	YRDFA		\$52.5						
Pilot Station Sonar Technician Support	AV/CP		\$13.3						
East Fork Andreafski River Weir	BSFA		\$31.1	\$68.4					
Nulato River Salmon Weir	BSFA		\$10.9	\$31.4	\$31.4		\$31.4		
Rampart Rapids Tagging Study	USFWS		\$100.0	\$100.0	\$100.0		\$100.0		
Kateel River Salmon Weir	USFWS		\$125.2	\$59.7	\$24.5				
Innoko River Drainage Weir Survey	USFWS		\$5.9						
Kaltag Chinook Salmon ASL Sampling	CK		\$1.2						
East Fork Andreafsky Weir Panel Replacement	USFWS		\$35.0						
Lower Yukon River Salmon Drift Test Fishing	ADFG, EMV		\$133.7	\$186.7	\$32.6				
Rampart Rapids Extension	USFWS		\$210.8	\$169.6	\$172.9				
Rampart Rapids Summer Cpue Video	SZ		\$36.1	\$14.1	\$14.1				
Tanana Fisheries Conservation Outreach	TTC		\$9.2	\$9.2	\$9.2				
Effects of <i>Ichthyophonus</i> on Yukon River Chinook Salmon	USGS		\$89.1	\$87.8					
Upper Yukon, Porcupine, and Black River Salmon TEK	CATG		\$64.9						
Pilot Station Sonar Technician Support	AV/CP				\$14.3				

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Table 1. Continued

Title	Investigators	Budget (\$000s)					
		2000	2001	2002	2003	2004	2005
Rampart Rapids Fall Chum Handling/Mortality	USFWS			\$45.0			
Sex-ratios of Juvenile and Adult Chinook, Kuskokwim & Yukon Rivers	USFWS			\$13.6	\$11.8		
Yukon River Chinook Genetics	USFWS, ADFG, DFO			\$173.2	\$228.2	\$160.0	
Yukon River Chinook and Chum Salmon In-Season Subsistence	USFWS			\$12.2			
Tozitna River Weir	BLM				\$27.0		
Gisasa River Weir	USFWS				\$70.1		
Phenotypic Characterization of Chinook Salmon Subsistence	YRDFA, USFWS				\$18.5		\$5.7
East Fork Andreafsky River Weir	USFWS				\$53.3		
Yukon River Sub-district 5-A Test Fishwheel	BF				\$32.9		
Tozitna River Weir	BLM					\$66.0	\$66.0
East Fork Andreafsky River Weir	USFWS					\$80.2	\$89.5
Gisasa River Weir	USFWS					\$79.5	\$82.8
Henshaw Creek Weir	USFWS					\$25.0	
Rampart Rapids Fall Chum Abundance	USFWS					\$295.7	\$304.1
Yukon River Chum Salmon GSI	USFWS					\$77.7	\$96.8
Lower Yukon River Salmon Drift Test Fishing	ADFG					\$104.9	\$17.0
Yukon River Chinook Salmon Telemetry	ADFG					\$296.9	
Kaltag Chinook Salmon ASL Sampling	CK					\$3.0	\$3.0
Tek Camp in Fort Yukon	TCC,CATG, ADFG					\$50.9	\$57.4
Tek Study of Upper Yukon River Salmon Fishery	NPS					\$23.1	\$26.9
Tanana Conservation Outreach	TTC, USFWS					\$25.9	\$25.9
Yukon River Salmon Management Teleconferences	YRDFA					\$15.0	\$15.0
Tek of Customary Trade of Subsistence Fish on Yukon River	YRDFA					\$39.4	\$11
Hooper Bay Subsistence Monitoring	ADFG, HBTC					\$36.1	
Coho Salmon Genetics, Yukon River	USFWS					\$22.1	\$27.8
Anvik River Sonar	ADFG					\$58.6	\$38.6
Tanana River Fall Chum Salmon Abundance	ADFG					\$200.4	\$416.2
Henshaw Creek Weir	USFWS, TCC					\$82.1	\$78.5
Yukon River Inseason Salmon Harvest Assessment	USFWS, YRDFA					\$34.0	\$30.0
Yukon River Chum Mixed Stock Analysis	USFWS						\$92.2
Subtotal		\$378.5	\$1,180.9	\$1,081.7	\$931.7	\$1,219.3	\$1,116.0
						\$1,214.7	\$258.5

Continued on next page

Table 1. Continued

Title	Investigators	Budget (\$000s)							
		2000	2001	2002	2003	2004	2005	2006	2007
Yukon River Non-Salmon Projects									
Humpback Whitefish/beaver Interactions	USFWS, CATG	\$46.0							
TEK-Beaver/whitefish Interactions	ADFG, CATG	\$39.3							
Dall River Northern Pike	ADFG, SV	\$24.0							
Humpback Whitefish in Upper Tanana River	USFWS	\$60.0	\$41.0	\$41.0	\$43.1				
TEK of Subsistence Harvests and Fish, Old John Lake	ADFG, AV, USFWS		\$52.0						
Subsistence Survey of Freshwater Fish, Arctic Village	ADFG, AV, USFWS		\$33.3						
TEK and Subsistence Uses of Koyukuk Non-Salmon Fish	ADFG, TCC		\$174.6						
Yukon Flats Northern Pike	ADFG, SV		\$292.0	\$45.5	\$30				
Gash Working Group	USFWS			\$34.2					
Subsistence of Freshwater Fish From Arctic Village	ADFG, NVV			\$32.7					
Lower Yukon River Harvest Monitoring of Non-Salmon Fish	ADFG, TCC			\$60.1	\$100.9	\$69.2			
Oral History and TEK of Subsistence, Old John Lake	USFWS, AV, ADFG			\$9.1					
Upper Tanana Subsistence Fisheries TEK Study	USFWS,UAF, ADFG					\$53.5	\$68.9	\$75.3	
TEK and Radio Telemetry of Whitefish, Kanuti Nwr	USFWS, RN					\$109.0	\$84.0	\$36.3	
TEK and Biological Sampling Non-Salmon	ADFG, USFWS, CATG							\$97.6	\$77.7
TEK and Harvest Survey Non-Salmon	ADFG, LTC							\$76.8	\$53.7
Subtotal		\$169.3	\$592.9	\$222.6	\$174.0	\$231.7	\$152.9	\$286.0	\$131.4
Total Yukon Region Monitoring Program		\$547.8	\$1,773.8	\$1,304.3	\$1,105.7	\$1,451.0	\$1,268.9	\$1,500.7	\$389.9

Table 2. Yukon Region project costs, by organization type, for investigation plans submitted to the Fisheries Resource Monitoring Program for funding consideration in 2007.

Project Number	Title	Project Costs (\$000s)			
		AK Native	State	Federal	Other
Stock Status and Trends Projects					
07-202	East Fork Andreafsky River Weir			\$148.6	
07-204	Lower Yukon River Salmon Drift Test Fishing		\$58.7		
07-206	Innoko River Inconnu Radio Telemetry		\$49.8	\$30.8	
07-207	Gisasa River Salmon Weir			\$123.0	
07-208	Tozitna River Salmon Weir			\$111.3	
Harvest Monitoring and Traditional Ecological Knowledge Projects					
07-251	Salmon Run Abundance and Timing in the Middle/Upper Yukon	\$30.6	\$55.0		\$60.4
07-252	Non-Salmon Fishing Practices and TEK in Northern Yukon Flats	\$3.0	\$80.7	\$6.0	
07-253	Continuity and Change in Yukon River Salmon Harvest Patterns				\$74.4

Table 3. Yukon Region local hire and matching funds for investigation plans submitted to the Fisheries Resource Monitoring Program for funding consideration in 2007. Abbreviations used are: ADFG=Alaska Department of Fish and Game, USFWS=U.S. Fish and Wildlife Service, BLM= Bureau of Land Management, WA=Wolfe and Associates

Project Number	Lead	Title	Funding (\$000s)	
			Local Hire	Matching
Stock Status and Trends Projects				
07-202	USFWS	Abundance and Run Timing Of Adult Salmon, E. Fork Andreafsky River	\$38.7	\$74.5
07-204	ADFG	Lower Yukon River Salmon Drift Test Fishing		\$19.4
07-206	USFWS	Innoko River <i>Inconnu</i> Radio Telemetry		\$23.0
07-207	USFWS	Gisasa River Salmon Weir	\$11.4	\$67.8
07-208	BLM	Tozitna River Salmon Weir	\$12.0	\$90.0
Harvest Monitoring and Traditional Ecological Knowledge Projects				
07-251	ADFG	Salmon Run Abundance And Timing in the Middle/Upper Yukon	\$4.7	\$19.0
07-252	ADFG	Non-Salmon Fishing Practices and TEK in Northern Yukon Flats		
07-253	WA	Continuity and Change in Yukon River Salmon Harvest Patterns		

stock status and trends (SST) projects, and \$259,000 for harvest monitoring and traditional ecological knowledge (HM-TEK) projects.

PRIORITIES FOR FUNDING

After reviewing the eight investigation plans, the Technical Review Committee prioritized them in the following descending order:

07-253	Continuity and Change in Yukon River Salmon Harvest Patterns	\$ 74,431
07-202	East Fork Andreafsky River Salmon Weir	\$ 148,623
07-207	Gisasa River Salmon Weir	\$ 123,016
07-204	Lower Yukon River Drift Test Fishing	\$ 58,708
07-252	Non-Salmon Fishing Practices and TEK in Northern Yukon Flats	\$ 89,691
07-206	Innoko River Inconnu Radio Telemetry	\$ 80,593
07-208	Tozitna River Weir	\$ 111,349
07-251	Salmon Run Abundance and Timing in the Middle/Upper Yukon	\$145,973

These eight projects are a mix of SST and HM-TEK projects, and all will provide information to be used in Federal subsistence fisheries management. A brief description of each project follows (see Executive Summaries for more details).

- **07-253 Continuity and Change in Yukon River Salmon Harvest Patterns** will document continuity, changes and trends in the subsistence salmon fisheries of the Yukon River Drainage. The study will examine existing data sets and data gathered from key informant interviews and systematic household surveys in selected communities of the lower, middle, and upper river.
- **07-202 East Fork Andreafsky River Salmon Weir** is a continuation projects that provides valuable information for Yukon River salmon management. The Andreafsky River weir supports a 12-year data set for salmon escapement in the lower Yukon River Geographic Unit. It operates from late June through July and provides escapement counts for Chinook and chum salmon.
- **07-207 Gisasa River Salmon Weir** is a continuation project which provides information for Yukon River salmon management and supports a 12-year data set for the lower Koyukuk River for salmon escapement in the lower Yukon River Geographic Unit. It operates from late June through the middle of August, and provides escapement counts for Chinook and chum salmon.
- **07-204 Lower Yukon River Drift Test Fishing** is a continuation project that provides one of the first reliable indications of run timing and strength for fall chum and coho salmon returning to the Yukon River.
- **07-252 Non-Salmon Fishing Practices and TEK in Northern Yukon Flats** compliments two completed and one on-going non-salmon TEK projects funded by the Monitoring Program to provide a good understanding of non-salmon harvest and use along the Yukon River. Investigators propose to collect TEK, place names and harvest information pertaining to non-salmon fish species in the communities of Arctic Village, Chalkyitsik, Ft. Yukon and Venetie.

Table 4. Funding recommendations by the Technical Review Committee (TRC) for Yukon Region projects, 2007 Fisheries Resource Monitoring Program

Project Number		Requested Budget (\$000)			
Title	TRC	2007	2008	2009	
Stock Status and Trends Projects					
07-202	East Fork Andreafsky River Weir	Yes	\$148.6	\$148.3	\$139.2
07-204	Lower Yukon River Salmon Drift Test Fishing	Yes	\$58.7	\$50.9	\$50.0
07-206	Innoko River Inconnu Radio Telemetry	Yes	\$80.6	\$73.2	\$30.2
07-207	Gisasa River Salmon Weir	Yes	\$123.0	\$127.4	\$135.1
07-208	Tozitna River Salmon Weir	Yes	\$111.3	\$111.3	\$111.3
SST Total			\$522.2	\$511.1	\$465.8
SST Funding Guideline			\$519.0		
TRC SST Recommendation			\$522.2	\$622.4	\$577.1
Harvest Monitoring and Traditional Ecological Knowledge Projects					
07-251	Salmon Run Abundance and Timing in the Middle/Upper Yukon	No	\$146.0	\$168.5	\$92.7
07-252	Non-Salmon Fishing Practices and TEK in northern Yukon Flats	Yes	\$89.7	\$76.4	\$86.0
07-253	Continuity and Change in Yukon river Salmon Harvest Patterns	Yes	\$74.4	\$204.4	\$46.1
HM-TEK Total			\$164.1	\$280.8	\$132.1
HM-TEK Funding Guideline			\$259.0		
TRC HM-TEK Recommendation			\$164.1	\$280.8	\$132.1
Total			\$832.3	\$960.4	\$690.6
Funding Guideline			\$778.0		
TRC Recommendation			\$686.3	\$791.9	\$597.9

- **07-206 Innoko River Inconnu Radio Telemetry** project will radio tag 50 sheefish annually from the Innoko River drainage and track them seasonally to spawning, feeding and overwintering habitats throughout the Yukon River drainage through 2011. Little information is available on the life history of sheefish in the Yukon River, and this project would add significantly to this information gap.
- **07-208 Tozitna River Weir** is a continuation project providing information for Yukon River salmon management. The Tozitna River weir supports five consecutive years of salmon escapement in the middle Yukon River Geographic Unit. It operates from late June through the middle of August, and provides escapement counts for Chinook and chum salmon.
- **07-251 Salmon Run Abundance and Timing in the Middle/Upper Yukon** project will document TEK of natural indicators pertaining to Chinook, summer chum and fall chum salmon abundance and timing in six Yukon River communities (Nulato, Huslia, Galena, Ft. Yukon, Nenana and Eagle). This information will be examined in the context of other information, including ecological data, historical salmon abundance estimates and local observations of environmental change, to elicit patterns and relationships between all sources of information.

RECOMMENDATIONS FOR FUNDING

The Technical Review Committee recommends funding seven of the eight projects under consideration. The amount requested by these projects for the first year totals \$686,411, and is within the funding guideline for this region. All seven projects recommended for funding address information of direct relevance and importance to subsistence fisheries under Federal jurisdiction, are technically sound, include a capacity building component, and the investigators are qualified to conduct the work (Table 4).

EXECUTIVE SUMMARIES

Project Number: 07-202
Project Title: Abundance and Run Timing of Adult Salmon, East Fork Andreafsky River
Geographic Region: Yukon
Data Type: Stock Status and Trends
Principal Investigator: Raymond Hander, USFWS Fairbanks Fish and Wildlife Field Office
Co-Investigator(s): Francis Thompson, Algaaciq Tribal Council
David Waltemeyer, Association of Village Council Presidents
Ursula Hunt, Yupiit of Andreafski Tribal Council

Cost: **2007:** \$148,623 **2008:** \$148,293 **2009:** \$139,221

RECOMMENDATION: Fund

ISSUE

The abundance and run timing of spawning populations of salmon within the Yukon River drainage have been identified as priority information needs by the Regional Advisory Councils, the Yukon River Comprehensive Management Plan for Alaska, and the Yukon River Joint Technical Committee Plan. The Andreafsky River system supports relatively large populations of Chinook, summer chum and coho salmon. The project's location in the lower river allows its escapement estimates to be used in-season by fishery managers. Data from the project are useful for post-season evaluation of management practices and provide insights for future run projections. The East Fork Andreafsky River weir has operated for the past twelve years and provides one of the longer term databases on escapement in the entire Yukon River, meeting the priority information need of the Office of Subsistence Management to "maintain reliable estimates of Chinook and chum salmon escapement over time." Andreafsky River salmon stocks comprise an important component of the diet of villagers along the Andreafsky River and the Yukon River below and including Pitka's Point. In addition, these stocks are harvested in commercial and subsistence fisheries below the confluence of the Andreafsky River from May through October. This investigation plan addresses enumeration of only Chinook and chum salmon.

OBJECTIVES

1. Determine daily escapement numbers and run timing of two species of adult salmon into the East Fork Andreafsky River.
2. Estimate the age, sex, and length composition of adult Chinook and chum salmon in the East Fork Andreafsky River.
3. Determine the numbers of resident fish species passing the weir.

METHODS

The location of the weir site is approximately 43 rkm upriver from the confluence of the Andreafsky and Yukon Rivers. A resistance board weir will be installed and operated on the Andreafsky River each year

from 2007 to 2009. The abundance of salmon and resident fish species will be recorded to determine run timing and escapement size. A stratified random sampling design will be used to collect age, length, and sex ratio information for Chinook and summer chum salmon.

PARTNERSHIPS/CAPACITY BUILDING

The Fairbanks Fish and Wildlife Field Office will work with the Office of Subsistence Management Fisheries Information Services staff to strengthen the capacity building component of this project. Consultation will occur with Ursula Hunt, Andreafsky Tribal Council Leader, and Francis Thompson, Algaaciq Tribal Government, for hiring people from the local area, and David Wages, St. Mary's School Principal, for coordination with the Science Camp. David Waltemeyer, Association of Village Council Presidents will be working with weir personnel to become more familiar with weir operations. The Fairbanks Fish and Wildlife Field Office will continue the long running precedence of hiring local persons to staff and operate the Andreafsky River weir and provide outreach and educational opportunities for the benefit of the local communities. Discussions will continue regarding the Association of Village Council Presidents becoming a co-investigator on the project during this funding cycle.

JUSTIFICATION

This project addresses an issue specifically identified as a high priority need in the 2007 Request for Proposals, namely maintenance of reliable estimates of Chinook and chum salmon escapement over time. The Andreafsky River weir supports one of the most comprehensive data sets (12 consecutive years) for salmon escapement in the lower Yukon River. It currently operates from late June through July, providing escapement counts for Chinook and chum salmon. The U.S. section of the Joint Technical Committee ranked the East Fork Andreafsky River weir as third in importance for Chinook salmon, fourth for summer chum salmon, and second for coho salmon among existing escapement projects. Managers use the information provided by this weir as an indicator of run timing and strength in the lower Yukon River Geographic Unit for Chinook and summer chum salmon.

Project Number: 07-204
Project Title: Lower Yukon River Salmon Drift Test Fishing
Geographic Region: Yukon
Data Type: Stock Status and Trends
Principal Investigator: Fred Bue and Eric Newland, ADFG Division of Commercial Fisheries

Cost: **2007:** \$58,708 **2008:** \$50,876 **2009:** \$50,876

RECOMMENDATION: Fund

ISSUE

Fluctuations in production of Yukon River fall chum salmon make optimal harvest management of the mixed stocks especially difficult. Most commercial salmon harvest occurs near the mouth of the Yukon River in Districts 1 and 2, whereas the majority of the subsistence harvest occurs in the upper portion of the drainage. The subsistence fishery has priority use of these resources, but the fish pass through the major commercial harvesting area in the lower river before they arrive into the upper regions where most of the subsistence harvest occurs. Fishery managers are challenged to quickly and accurately assess run timing and abundance inseason to ensure that sufficient numbers of salmon pass through the downstream commercial fishing districts in order to provide for subsistence needs and adequate escapements to Alaskan and Canadian streams.

This proposal is an extension of the FIS 04-229 cooperative project. The U.S. section of the Joint Technical Committee ranked the lower Yukon River cooperative fall salmon drift test fishing project as one of the highest assessment projects for fall chum salmon based on its performance and utility for providing information relevant for management decisions. Both State and Federal managers are in direct contact with this project inseason which enables a good understanding of the data and its relevance to the fisheries as the salmon return.

OBJECTIVES

The objectives for the lower Yukon River fall salmon drift gillnet test fishery are to:

1. Estimate relative abundance of fall chum and coho salmon on a daily basis as they enter the mouth of the Yukon River.
2. Estimate run timing of fall chum and coho salmon as they enter the mouth of the Yukon River.
3. Estimate the age, sex, and length composition of the return of fall chum and coho salmon for use in brood year assessment and run forecasting.
4. Build partnerships and capacity by involving local technicians and communities in the project operation and information sharing.

METHODS

Project operation and data collection will be conducted in a manner similar to the project's operations over the past five fall seasons. Two test fish crews will be assigned one each to the Big Eddy and Middle Mouth locations. Drift test fishing will be conducted twice daily at each location using standardized methods and gear for consistency to allow time-series comparisons with previous years. Fishing times and catch by species are recorded and catch per unit effort data is calculated for each drift. Age-sex-length sample data will be collected from a portion of the catch lost due to netting mortality with all mortalities distributed locally.

Test fishing results will be recorded twice daily on Excel spreadsheets at the ADFG Emmonak field office, consolidated and distributed daily to ADFG and USFWS offices. Daily results are made available to the public via an ADFG recorded telephone message. ADFG also provides test fish information to the public in weekly update packets which include other current Yukon River fisheries information that are distributed by fax, email, and web-posting. The updates track the project in season and makes relative comparisons to previous years and subjective observations. Post season, test fish data will be incorporated in annual project reports and merged into a larger data base for access by other studies.

PARTNERSHIPS/CAPACITY BUILDING

Staff from the Division of Commercial Fisheries would work cooperatively with local staff from the Yukon Delta Fisheries Development Association to recruit and appoint local technicians into crew-member positions. Participants would collect data utilizing drift gill nets and use standardized techniques for taking biological samples. In addition, staff from ADFG would mentor local-hire staff to develop skills for advancement within the program. The project will be reviewed inseason by the Regional Advisory Council and communities throughout the Yukon River drainage during teleconferences sponsored by the Yukon River Drainage Fisheries Association. The project has been used in the past as a platform to collect biological samples for other studies which will be considered an important function in the future as time permits and opportunities are presented. The annual start up of the fall drift project would be an extension of the summer chum salmon drift test fish project that has cooperative funding from ADFG and the Community Development Quota Program. The Yukon River Drainage Fisheries Association plans to continue their capacity building commitments by providing additional local technicians to assist in this project as well as overlap with other harvest monitoring projects operating in the same location.

JUSTIFICATION

Although the production of Yukon River fall chum salmon has improved since 2003, the Alaska Board of Fisheries has designated Yukon River fall chum salmon as stocks of yield concern. In 2001, the amounts necessary for subsistence (ANS) for Yukon River salmon species was revised. For fall chum salmon the range, based on historical harvests, was set to 89,500 to 167,100 fish annually. The subsistence harvest of fall chum salmon has fallen below the ANS range in five of the last six years. Based on the 1998–2002 averages, approximately 17% of the subsistence harvest and 97% of the commercial harvest of Yukon River fall chum salmon occurs in the lower Yukon River. This project provides one of the first reliable indications of run timing and strength for fall chum and coho salmon returning to the Yukon River. The U.S. Section of the Joint Technical Committee ranked the lower Yukon River cooperative salmon drift test fishing project as one of the highest priority assessment projects for fall chum salmon.

Project Number: 07-206
Project Title: A Radio Telemetry Investigation of the Spawning Origins of Innoko River Sheefish
Geographic Region: Yukon
Data Type: Stock Status and Trends
Principal Investigator: Randy Brown, USFWS Fairbanks Fish and Wildlife Field Office
Co-Investigator(s): John Burr, ADFG Division of Sport Fisheries
Caroline Brown, ADFG Division of Subsistence

Cost: 2007: \$80,593 2008: \$73,159 2009: \$30,240 2010: \$30,976 2011: \$43,187

RECOMMENDATION: Fund

ISSUE

Although not identified as a formal priority in the 2007 Monitoring Program, life history and stock distribution information regarding sheefish and other whitefish species utilized in the subsistence fisheries of the Yukon River drainage will be critical for future management of these stocks. Previous sheefish studies carried out in the Innoko River and elsewhere in the Yukon River drainage suggest that they use the Innoko River for feeding only and migrate elsewhere to spawn. Five spawning areas have been identified in the Yukon River drainage; two in the upper Koyukuk River, one in the upper reaches of the Yukon Flats, one in the upper Nowitna River, and one in the Chatanika River. At this point it appears that most or all sheefish in the drainage originate in one of these spawning areas. During their annual migrations between overwintering, feeding, and spawning areas, Innoko River sheefish would undoubtedly be subject to a wide variety of commercial, subsistence, and sport fisheries within the Innoko River and elsewhere in the Yukon River drainage. If Innoko River sheefish are members of Yukon River populations that spawn elsewhere, as suggested by previous studies, then effective management will be possible only by identifying the contributing stocks, the user groups throughout the range of each contributing stock, and the magnitude of the fishery harvests. In this study we propose to use radio telemetry techniques to test the hypothesis that Innoko River sheefish are members of Yukon River populations that spawn in locations other than the Innoko River drainage, and identify the spawning locations of those contributing stocks. Other biological data will be gathered as well, including spawning frequency, feeding habitat fidelity, and annual survival rates.

OBJECTIVES

1. Identify the spawning origins of sheefish radio-tagged in the Innoko River during summer by surveying known and suspected spawning areas in the drainage during spawning season.
2. Determine spawning frequency of radio-tagged sheefish by locating fish on spawning grounds over the course of four spawning seasons.
3. Investigate feeding habitat fidelity of radio-tagged sheefish by surveying major feeding habitats in the drainage during four summer feeding seasons.
4. Estimate annual survival of radio-tagged sheefish directly by assessing the status of each tagged fish over time.

5. Estimate the proportional contributions of identified spawning stocks to the aggregation of feeding sheefish in the Innoko River during 2007 and 2008.
6. Involve students and other Shageluk community members in the project directly during the tagging component of the project, and provide location data so the community can map the migrations of tagged fish through time.

METHODS

Radio telemetry techniques will be used in this study to identify the spawning origins of mature sheefish (≥ 72.5 cm fl) tagged in the Innoko River drainage during the summer feeding season. The transmitters will be surgically implanted in candidate fish. They will be programmed to operate for eight weeks during each of three seasons; spawning during September and October, overwintering during January and February, and feeding during May and June. They are expected to last for well over 4 years with this operating schedule. Aerial surveys will be conducted to locate tagged fish in known or possible spawning areas, feeding habitats, and overwintering locations. Spawning destinations will be identified based on the presence of radio-tagged fish in previously identified spawning areas, or in new areas of riverine habitats with gravel substrate during late September and early October. Spawning frequency will be evaluated based on the time intervals between spawning events, as determined by their presence in spawning areas during the fall. Feeding habitat fidelity will be investigated based on their presence in the same or different geographic areas during the summer feeding season from one year to the next. Annual survival will be estimated directly based on the fraction of tagged fish that are known to survive from one year to the next. Survival will be judged based on seasonal migrations. Stock contributions to the Innoko River feeding aggregation will be estimated based on the fraction of all sheefish located in spawning habitats that migrate to particular spawning areas. Some of the tagging will be conducted in the vicinity of Shageluk, and regular contact with the Shageluk School and sharing of location data will ensure community awareness and involvement in the project and its findings.

PARTNERSHIPS AND CAPACITY BUILDING

Caroline Brown has initiated an arrangement with Joy Hamilton, a teacher in the Shageluk School, to involve middle school students in an educational unit focused on this project. They will read about the project, join us in tagging fish in the Shageluk area, map migrations based on tag locations during the course of the year, share migration data with elders in the community, interview elders about their knowledge and how it relates to the telemetry findings, and write about the project. In this way, the students will take some ownership of the project and communicate the findings to the community.

JUSTIFICATION

Sheefish are an important subsistence resource throughout the Yukon River drainage. Currently, there is little information available on the life history of sheefish in the Yukon River. Sheefish are targeted in subsistence, commercial and sport fisheries, and caught incidentally in salmon fisheries. This project would build on the work initiated in 2005 on the lower Nowitna River. In 2007–2008, investigators propose to radio tag 50 sheefish annually from the Innoko River drainage and track them seasonally through 2011. This project will provide the opportunity to relocate each fish four times during spawning and feeding periods and three times during the overwintering period. The investigators have a strong capacity building component incorporating multiple disciplines and emphasizing outreach to local

communities. The Technical Review Committee recommends funding this project for 3 years, with years 4–5 funding contingent upon committee review.

Project Number: 07-207
Project Title: Abundance and Run Timing of Chinook and Summer Chum Salmon in the Gisasa River, Koyukuk National Wildlife Refuge, Alaska
Geographic Region: Yukon
Data Type: Stock Status and Trends
Principal Investigator: Mark Voight, USFWS Fairbanks Fish and Wildlife Field Office

Cost: **2007:** \$123,016 **2008:** \$127,440 **2009:** \$135,138

RECOMMENDATION: Fund

ISSUE

Assessment of management actions for Yukon River salmon fisheries is difficult due to the limited number of escapement studies in the drainage. Within the Koyukuk River drainage, a major tributary in the middle-lower Yukon River, the Gisasa River weir is one of two projects (Henshaw Creek weir) that provides inseason information to assess management actions as well as a postseason indexes of escapements of other tributaries within the Koyukuk River. Federal and State managers have consistently identified this project as an important source of information for fishery management. Also, the Yukon River Comprehensive Management Plan describes the need for escapement monitoring projects in the Koyukuk River region. Further, in November 2005 the Joint Technical Committee of the Yukon River Panel identified the Gisasa River weir as the second highest priority among lower river projects for Chinook salmon. The project was also identified as the third highest priority for summer chum salmon. The Gisasa River weir has operated for the past twelve years and provides one of the longer term databases on escapement in the entire Yukon River.

OBJECTIVES

This project is proposed as a three-year (2007–2009) study. The objectives are:

1. Enumerate the daily passage of Chinook and summer chum salmon.
2. Describe the age, sex, and length of Chinook and summer chum salmon.
3. Enumerate the daily passage of resident fish species.

METHODS

Investigators will install a resistance board weir across the Gisasa River, 4 km upstream from the mouth of the Gisasa River. The weir and passing chute will funnel fish into a live trap, which holds the fish so they can be counted (by species). Fish sampling will include measuring length, determining sex, and collecting scales.

PARTNERSHIP/CAPACITY BUILDING

Fairbanks Fish and Wildlife Field Office and the Refuge have strived for local involvement and capacity building with the project, and initial interest had been expressed by residents in the Galena area. However, the remoteness of the weir site reduces the attraction of the project, and subsequent interest has not developed. Nevertheless, the Fairbanks Fish and Wildlife Field Office and the Refuge are committed to continually promoting capacity building by describing project opportunities at Regional Advisory Council, Yukon River Drainage Fisheries Association, and Refuge coordination meetings. In 2007, renewed efforts will focus on promoting the project and the potential for local involvement to tribal and village groups in the lower Koyukuk River area.

JUSTIFICATION

This project addresses an issue specifically identified as a high priority need in the 2007 Request for Proposals, namely maintenance of reliable estimates of Chinook and chum salmon escapement over time. The project is technically sound and the Gisasa River weir supports one of the most comprehensive data sets (12 consecutive years) for salmon escapement in the lower Yukon River Geographic Unit for Chinook and summer chum salmon. It currently operates from late June through the middle of August, and provides escapement counts for Chinook and chum salmon. The U. S. Section of the Joint Technical Committee ranked the Gisasa River weir as second importance for Chinook salmon and third for summer chum salmon among existing escapement projects. Managers use the information provided by this weir project as an indicator of run timing and strength.

Project Number: 07-208
Project Title: Abundance and Run Timing of Adult Salmon in the Tozitna River
Geographic Region: Yukon
Data Type: Stock Status and Trends
Principal Investigator: Bob Karlen, Carl Kretsinger, and Jason Post, Bureau of Land Management

Cost: **2007:** \$111,349 **2008:** \$111,349 **2009:** \$111,349

RECOMMENDATION: Fund

ISSUE

There is a need to document the abundance and run timing of salmon spawning in the middle and upper portions of the Yukon River. This data gap has been identified by fishery managers and as part of the Yukon River Comprehensive Salmon Plan for Alaska. The current lack of information makes it difficult for Federal and State managers to adjust fishing schedules to assure that the many objectives of salmon management are met. Recent severe declines in Yukon River drainage salmon runs have resulted in additional concerns about conserving stocks and providing for subsistence uses. The region's Regional Advisory Councils have called for a range of studies to address the salmon declines, including new projects that assess the production of salmon from tributary streams and quantify their contribution to the overall productivity of the Yukon River drainage. The Tozitna River escapement project addresses these concerns.

OBJECTIVES

1. Count adult Chinook and summer chum salmon passing through the weir.
2. Describe run-timing characteristics of Chinook and summer chum salmon.
3. Estimate the proportion of Chinook and summer chum salmon spawning in the Tozitna River downstream of the weir and document the location of spawning habitat throughout the drainage using aerial survey techniques.
4. Estimate the age and sex composition of Chinook and summer chum salmon weekly.
5. Estimate the mean length of Chinook and summer chum salmon by sex and age.

METHODS

The Bureau of Land Management (BLM) proposes to count adult Chinook and summer chum salmon as they pass through a floating resistance-board weir located at river kilometer 79 on the Tozitna River. Counting and sampling for age, sex, and length information would begin with the arrival of the first salmon and continue until the daily salmon passage drops to <1% of the cumulative count for three consecutive days for both species.

PARTNERSHIPS/CAPACITY BUILDING

In 2005 (and again in 2006), the Yukon River Drainage Fisheries Association provided BLM with a research assistant who provided the project with over 30 years of local knowledge. In an ongoing effort to involve nearby communities in the project, BLM would like to continue hiring rural residents while using the Yukon River Drainage Fisheries Association as a source of technicians for the project. If the project is funded, BLM will put a portion of the money into an agreement with the Yukon River Drainage Fisheries Association to cover the annual cost of one technician for the project.

To further capacity development, BLM also presents the Tozitna River escapement data annually to the Resource Advisory Councils as a means of information sharing with subsistence users of the Yukon River. BLM has also promoted interaction with subsistence users through the Partners for Fisheries Monitoring Program. Kim Elkin (Tanana Chiefs Conference) and Dave Waltemyer (Association of Village Council Presidents) and their technicians from the Partners Program visited the Tozitna project in 2003 in an effort to gain exposure to project operations and data gathering methodologies. BLM encourages continued information sharing like this in the future.

JUSTIFICATION

This project addresses an issue specifically identified as a high priority need in the 2007 Request for Proposals. The project is technically sound and supports 5 consecutive years of salmon escapement in the middle Yukon River. The U.S. Section of the Joint Technical Committee ranked the project as sixth importance for both Chinook and summer chum salmon, making the Tozitna River weir the lowest ranked Chinook salmon monitoring project in the lower Yukon River Geographic Unit. Managers use the information provided by this weir as an indicator of run timing and strength for the lower Yukon River Geographic Unit for Chinook and summer chum salmon.

Project Number: 07-251
Project Title: Traditional Ecological Knowledge of Salmon Run Abundance and Timing in the Middle and Upper Yukon River Area
Geographic Region: Yukon
Data Type: Harvest Monitoring/Traditional Ecological Knowledge
Principal Investigator: Caroline Brown, ADFG Division of Subsistence
Co-Investigator(s): Catherine Moncrieff and Kristin Mull, Yukon River Drainage Fisheries Association
David Andersen, Research North
Ed Krause, Huslia Traditional Council

Cost: **2007:** \$145,973 **2008:** \$168,503 **2009:** \$92,699

RECOMMENDATION: Do Not Fund

ISSUE

Yukon River managers face significant challenges in assessing salmon run timing and abundance both in the pre-season outlooks and during inseason management. Between 1997 and 2002, sharp declines in salmon abundance caused severe hardship for fishery-dependent communities in the Yukon River drainage. This project focuses on locally significant methods for assessing salmon runs, documented in six representative communities within the middle and upper Yukon River drainage. The primary goal is to document this traditional ecological knowledge (TEK) through ethnographic interviews, mapping, and participant-observation, and then correlate it with recorded, geographically-specific environmental change. TEK research will document long-term observations of relationships between salmon runs and environmental factors that will contribute to management priorities by a) broadening the field of correlatives that have significance for understanding Yukon River salmon runs, and b) generating new research questions based on these correlatives that may address management priorities of providing more accurate assessments of salmon run timing and abundance.

OBJECTIVES

1. Document TEK of natural indicators for Chinook, summer chum, and fall chum salmon in six middle and upper Yukon communities.
2. Promote capacity building in local communities, tribal organizations, non-profit organization and governmental agencies
3. Analyze relationships and patterns between documented TEK of natural indicators, ecological data, historical salmon abundance estimates, and local observations of environmental change

METHODS

Researchers will employ a variety of social science methods, including semi-structured interviews, participant-observation, and mapping. Researchers will attempt to conduct an average of 8–10 interviews per community. The interview protocol will be designed to elicit information about natural indicators and

other techniques utilized in locally assessing various characteristics of the run itself as well as harvesting or processing salmon during the run. Prior to fieldwork, Principal Investigators will conduct an extensive literature review of existing data on natural indicators.

PARTNERSHIPS/CAPACITY BUILDING

This project will build capacity for all research partners in several ways. Principal investigators will hire local research partners in each community to assist with setting up and conducting interviews. Huslia researchers will build capacity through increased experience conducting TEK research and analyzing the results, complementing their current work on a Tribal Wildlife Grant, and assist other investigators with research protocol design. All research partners will be trained in GIS methods and techniques in compiling mapped data. Finally, social scientists partners will benefit from working with biologically trained researchers in developing research questions and analyzing data, while biologist principal investigators will be exposed to ethnographic interviewing and analysis.

JUSTIFICATION

The Technical Review Committee does not recommend this investigation plan for funding. Investigators are uniquely well qualified to conduct the proposed research, and have performed successfully on numerable Monitoring Program projects. The capacity building parameters of the project are high, and the partnership of investigators is particularly strong. However, while the ideas are interesting, the analytical component is not well developed, and the management application is questionable and not well described in the investigation plan. The cost, which increased 41% over the proposal, is extremely high, especially given the experimental nature of the project design. Nonetheless, the project explores some ideas that are worth further development and investigators should think about designing a small pilot study to test the approach, or to utilize the project currently funded by the Arctic-Yukon-Kuskokwim Sustainable Salmon Initiative to further develop the analytical approach.

Project Number: 07-252
Project Title: Non-Salmon Fishing Practices and Traditional Knowledge in the Northern Yukon Flats Region of Alaska
Geographic Region: Yukon
Data Type: Harvest Monitoring/Traditional Ecological Knowledge
Principal Investigator: Mike Koskey, ADFG Division of Subsistence
Co-Investigator(s): Hishinlai' "Kathy" Sikorski, UAF Alaska Native Language Center
Ingrid McSweeney, Bureau of Land Management
Wennona Brown, USFWS Yukon Flats National Wildlife Refuge
Davey James, Gwichyaa Zhee Gwich'in Tribal Government

Cost: **2007:** \$89,691 **2008:** \$76,433 **2009:** \$85,957

RECOMMENDATION: Fund

ISSUE

Non-salmon fish are an important subsistence resource. There may be an inverse relationship between salmon and non-salmon harvests, but there is little in-depth information on the changes that have influenced non-salmon fishing practices in the Northern Yukon Flats region. The ADFG Community Subsistence Information System reports wide variation in the contribution of non-salmon fish to the regional subsistence harvest by both year and location. The greatest take of non-salmon fish reported for a single year (1987) was in Fort Yukon at 75,965 pounds (29,083 fish). The proposed project will provide information on the contemporary harvest and use of non-salmon fish by residents of four Yukon Flats communities: Chalkyitsik, Venetie, Arctic Village and Fort Yukon—and to place these data within a historical framework of changing fishing practices within the region

OBJECTIVES

This project is designed on a three-year time-frame with the following goals:

1. Document the traditional ecological knowledge of non-salmon fish species in the Yukon Flats communities of Fort Yukon, Chalkyitsik, Venetie, and Arctic Village.
2. Estimate the harvest levels and use patterns of non-salmon fish species by village residents through systematic household surveys.
3. Identify and document historic and contemporary non-salmon harvest areas through resource use and Gwich'in placename mapping.

METHODS

The project relies on semi-structured ethnographic interviews with elders and other knowledgeable fishers, mapping, placename analysis, archival research, and participant-observation in order to address the first objective. The second objective is addressed through the implementation of a household harvest survey in each community conducted by a local research assistant. The final objective is addressed

through a review of previously collected Gwich'in placenames as well as resource use mapping to be conducted during ethnographic interviews and reviewed during community meetings

PARTNERSHIPS/CAPACITY BUILDING

One of the primary strengths of this project is the cooperation of five organizations representing two Federal agencies (BLM and USFWS), one State agency (ADFG), one academic institution (Alaska Native Language Center), and one Alaska Native government (Gwichyaa Zhee).

JUSTIFICATION

The Technical Review Committee recommends funding this project. This is a potentially important project that ties in with several other Monitoring Program funded projects to provide a comprehensive understanding of non salmon harvest and use along the Yukon River. The project addresses an issue specifically identified as a high priority in the 2007 Request for Proposals, namely evaluating patterns and trends in subsistence fish harvests for important non-salmon fish species, and will likely provide valuable information for Federal subsistence fisheries management. The project is technically sound, contains a solid capacity building project, and investigators are qualified to conduct the proposed work. Investigators responded to Technical Review Committee comments in full. The budget increased 33% over the proposal submitted in January 2006.

Project Number: 07-253
Project Title: Continuity and Change in Salmon Harvest Patterns, Yukon River Drainage, Alaska
Geographic Region: Yukon
Data Type: Harvest Monitoring/Traditional Ecological Knowledge
Principal Investigator: Robert J. Wolfe, Robert Wolfe and Associates
Co-Investigator(s): Cheryl Scott, Alaskan Connections

Cost: 2007: \$74,431 **2008:** \$204,370 **2009:** \$46,116

RECOMMENDATION: Fund

ISSUES

The primary issues addressed are the factors contributing to changes in subsistence harvest patterns for salmon along the Yukon River since the 1990s, the period of recent collapse of summer chum, fall chum, and coho salmon runs and restrictions of local subsistence and commercial salmon fisheries. The study will describe and analyze continuity, change, and trends in harvest patterns of federally-qualified subsistence users during this time period. The analysis will clarify how local families have responded to the salmon downturn in terms of household participation rates, fishing areas, mobility, use of seasonal fishing camps, types of equipment (such as boats, motors, fishwheels, net mesh size, and net length), effort, labor force composition, commercial-subsistence fishing interactions, species selection, harvests of fish, furbearers, and other wildlife, customary management practices, and other factors. The research will explore relationships of subsistence salmon harvests with other sectors of the local socioeconomic system, including commercial salmon harvests, furbearer harvests, and other fish and wildlife harvests. This type of information fits with Priority Information Needs for the Yukon Region: "Evaluate patterns and trends in subsistence fish harvests; factors to include, but are not limited to, demographic, economic, regulatory, and cultural issues."

OBJECTIVES

The objective of this study is to document continuity, change, and trends in the subsistence salmon fisheries of the Yukon River drainage as families have responded to salmon declines during the 1990s. The research will describe and examine continuity and changes in factors such as the following: local participation in salmon fishing, fishing efficiency, equipment, areas, mobility, fishing camps, species composition, workers, dogs, dog food, trapping/hunting furbearers, customary management of furbearer areas, commercial-subsistence fishing relationships, and out-migration of family members. The objective of the analysis is to produce a report that assesses continuity and change in these factors.

METHODS

The primary methods are face-to-face interviews with knowledgeable, local subsistence experts, and systematic surveys of households in three villages in the lower, middle, and upper Yukon River drainage.

Additional methods are the compilation and analysis of existing databases on fish harvests by area, and consultation with other experts familiar with the fisheries.

PARTNERSHIPS/CAPACITY BUILDING

This project will develop partnerships and build capacity in rural villages. Before collecting new information, the first year provides a period of consultation with rural villages, fishing organizations, and local experts. The principal investigator will train three local researchers at each village location in social science methodology, including training in survey construction, sample selection, survey administration, note taking, key respondent interviews, and data management techniques. The local researchers will be responsible for conducting household interviews, comprising a central part of the study. To the extent the local researchers are members of existing rural organizations, this training will build capacity in local entities as well as in individuals. The project will pay honorarium to persons interviewed as part of the project. This recognizes the significant contributions of their knowledge in documenting trends and patterns in subsistence fisheries.

JUSTIFICATION

The Technical Review Committee recommends funding this project. The project addresses an issue specifically identified as a high priority issue in the 2007 Request for Proposals, namely to evaluate patterns and trends in subsistence fish harvests, including demographic, economic, regulatory and cultural issues. Project investigators are uniquely qualified to conduct the proposed work, and have a proven track record in conducting complex analyses such as the one described in this investigation plan. Investigators were highly responsive to all the Technical Review Committee comments, and have provided a very thorough, well written, and technically sound project. While somewhat high, the budget is clearly justified in the investigation plan, and based on the extensive involvement of the principal investigators in all phases of the project, appears justified. Understanding changing harvest patterns is a critical element of Federal subsistence fisheries management, and this research will make a significant contribution towards this goal. Investigators are encouraged to include an assessment of the effects of windowed fishing schedules on subsistence fishing in their analysis.

KUSKOKWIM REGION OVERVIEW

ISSUES AND INFORMATION NEEDS

The two Kuskokwim Regional Advisory Councils (Yukon-Kuskokwim Delta and Western Interior Councils), with guidance provided by the Kuskokwim Fisheries Resource Coalition (Kuskokwim Coalition)¹, have identified a number of broad categories of issues and information needs for the Kuskokwim Region. These include collection and analysis of traditional ecological knowledge; harvest monitoring; salmon assessment and escapement; non-salmon fish species assessment; and marine/coastal salmon ecology and contaminants. Monitoring Program project selections to date have generally addressed these issues. The 2007 Request for Proposals identified three high priority issues for the Kuskokwim Region: evaluating patterns and trends in subsistence fish harvests; estimating subsistence salmon harvests; and maintaining reliable estimates of abundance, run timing, stock structure, productivity, and carrying capacity of salmon stocks.

A strategic salmon planning process was completed by the Kuskokwim Coalition for the Kuskokwim Region in 2006. This three-year effort was funded by the Office of Subsistence Management, the Arctic Yukon Kuskokwim Sustainable Salmon Initiative, and the Bering Sea Fisheries Association, which also administered the planning effort. Proposals and investigation plans submitted to the Monitoring Program for 2007 were reviewed by the Kuskokwim Coalition in light of priorities established in the completed salmon plan. Strategic planning in the Kuskokwim Region for non-salmon species will be initiated after 2007 by the Office of Subsistence Management.

PROJECTS CURRENTLY FUNDED UNDER THE FISHERIES RESOURCE MONITORING PROGRAM

Since the inception of the Monitoring Program in 2000, 57 projects have been funded in the Kuskokwim Region, and seven of these will still be operating during 2007 (Table 1). These projects provide information needed to manage and conserve subsistence fisheries resources, address fisheries issues and priorities identified by the Kuskokwim Regional Advisory Councils and address regulatory actions. Presently, the Monitoring Program supports over 50% of all fisheries monitoring and research conducted in the Kuskokwim Region.

PROJECTS FORWARDED FOR INVESTIGATION PLAN DEVELOPMENT

Eight proposals for research in the Kuskokwim Region were submitted to the Office of Subsistence Management. The Technical Review Committee reviewed the proposals and recommended six for development of investigation plans. Investigators responded to Technical Review Committee proposal review comments in developing their investigation plans, and worked with Office of Subsistence Management staff to accomplish revisions. Detailed budgets submitted with each investigation plan allowed identification of funds requested by Alaska Native, State, Federal, and other organizations;

¹ The Kuskokwim Fisheries Resource Coalition, composed of key fisheries staff from the Association of Village Council Presidents, Tanana Chiefs Conference, Orutsarmiut Native Council, Kuskokwim Native Association, McGrath Native Village Council, Alaska Department of Fish and Game, and the U.S. Fish and Wildlife Service has been instrumental in providing coordination and recommendations for the Kuskokwim Fisheries Resource Monitoring Program.

Table 1. Summary of projects funded under the Fisheries Resource Monitoring Program in the Kuskokwim Region by subsistence fishery, 2000–2007. Abbreviations used for investigators are: ADFG=Alaska Department of Fish and Game, AVCP=Association of Village Council Presidents, BSFA=Bearing Sea Fisherman's Association, KNA-Kuskokwim Native Association, MNVC=McGrath Native Village Council, NPT=Nuniarmiut Piciyavata Tamaryalkuti, Inc., ONC=Orutsarmiut Native Council, OVK-Organized Village of Kwethluk, TNC=Tuluksak Native Community, USFWS=U.S. Fish and Wildlife Service.

Title	Investigators	Budget (\$000s)							
		2000	2001	2002	2003	2004	2005	2006	2007
Kuskokwim River Salmon Projects									
Tatlawiksuk River Weir	ADFG, KNA	\$30.0	\$22.9	\$30.0	\$87.1				
Kwethluk River Weir	USFWS, OVK	\$204.9	\$113.0	\$117.2	\$116.6				
Documentation/communication on Floating Weirs	AVCP	\$5.2							
Kuskokwim Salmon Project Site Surveys	ADFG, USFWS	\$12.9							
Tuluksak River Weir	USFWS, TNC		\$200.2	\$130.8	\$138.3				
Genetic Diversity of Kuskokwim River Chinook	ADFG, USFWS		\$125.1	\$154.1	\$10.0				
Kuskokwim River Escapement Project Technician	ONC		\$10.7	\$12.9	\$14.0				
Natural Resource Internship Program	KNA		\$78.9						
Kuskokwim River Salmon Work Group Support	ADFG		\$20.9	\$99.4					
Kuskokwim Salmon ASL Assessment	ADFG		\$56.6	\$98.3	\$37.1				
Holitna River Chinook, Chum and Coho Telmetry	ADFG		\$672.7						
Kuskokwim River Chinook Inriver Abundance	ADFG			\$177.2	\$70.8	\$92.1			
Kuskokwim River Salmon Mark Recapture	ADFG, KNA				\$50.1				
Kuskokwim Coho Salmon Genetics	ADFG, USFWS				\$38.3				
Kuskokwim Science Plan	BSFA				\$65.0				
Kwethluk River Weir	USFWS, OVK					\$131.2	\$121.2	\$131.2	
Tuluksak River Weir	USFWS, TNC					\$119.6	\$119.6	\$119.6	
Holitna River Chinook and Chum Salmon Telemetry	ADFG					\$231.1			
Kuskokwim Salmon ASL Sampling Program	ADFG					\$85.3	\$87.8	\$87.8	
Kalskag Mark Recapture Study	ADFG					\$141.2	\$144.8	\$144.8	
KNA Internship Program	KNA					\$23.4	\$23.4	\$23.4	
Tatlawiksuk River Weir	ADFG, KNA					\$200.2	\$42.2	\$122.2	
Kuskokwim Coho Salmon Genetic Mixed Stock Assessment	USFWS					\$66.2			
Bethel Inseason Subsistence Harvest Data	ONC	\$17.7							
Bethel Post-Season Harvest Monitoring	ADFG, ONC	\$32.2							
Planning Meetings in AVCP Region	AVCP, KNA		\$34.4						

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Table 1. Continued

Title	Investigators	Budget (\$000s)							
		2000	2001	2002	2003	2004	2005	2006	2007
Upper Kuskokwim River Inseason Data	ADFG, MNVC		\$16.1	\$30.7	\$12.1				
Bethel Area Post-Season Fishery Household Surveys	ADFG, ONC		\$32.3	\$32.3	\$32.3				
Bethel Area Inseason Subsistence Salmon Harvest Data	ONC, ADFG		\$46.1	\$55.3	\$38.5				
Survey of Sport Fisheries, Aniak River	ADFG, KNA		\$100.8						
Middle Kuskokwim River Inseason Salmon Harvest	KNA, ADFG, USFWS		\$47.4	\$45.7	\$24.0				
Subsistence Fisheries Research Capacity Building	ADFG		\$31.8	\$15.9					
Aniak Area Post-season Subsistence Fishery Surveys	ADFG, KNA			\$10.2					
Bethel Area Inseason Subsistence Salmon Data Collection	ADFG, ONC				\$62.4				
Kuskokwim Postseason Subsistence Salmon Harvest Surveys	ADFG, KNA, ONC				\$158.5				
Inriver Abundance of Chinook Salmon	ADFG					\$357.6	\$346.2		
George And Takotna River Weirs	ADFG					\$72.0	\$168.2		
Kuskokwim Chinook Salmon Genetic Stock Identification	ADFG					\$106.0	\$73.2	\$18.7	
Lower Kuskokwim Salmon Subsistence Harvest ASL Sampling	ADFG, ONC					\$41.6	\$47.5	\$56.4	
Lower Kuskokwim River Subsistence Fisheries Catch Monitoring	ONC					\$26.5			
Kuskokwim Area Postseason Subsistence Harvest Survey	ADFG, ONC, KNA					\$74.2	\$74.2	\$74.3	
Lower Kuskokwim River Subsistence Fisheries Catch Monitoring	ONC						\$33.9	\$36.0	
Kuskokwim River Cooperative Salmon Management	ADFG						\$31.0	\$32.3	
Subtotal		\$302.9	\$1,609.9	\$1,010.0	\$734.2		\$1,403.3	\$217.7	
Kuskokwim Bay Salmon Projects									
Extend Goodnews River Weir Operations	ADFG	\$25.0	\$25.0	\$25.0	\$27.4				
Goodnews River Weir Coho Extension	ADFG					\$55.7	\$28.2		
Extend Kanektok River Weir Operations	USFWS	\$3.0	\$1.5						
Kanektok River Salmon Weir	ADFG, BSFA		\$122.5	\$131.5	\$123.7				
Kanektok River Weir	ADFG, BSFA					\$114.4	\$145.0	\$130.7	
Kuskokwim Bay TEK and Oral History	USFWS					\$60.5	\$14.6		
Nunivak Island Subsistence Fisheries	NPT						\$61.0	\$45.0	
Subtotal		\$28.0	\$149.0	\$156.5	\$151.1	\$230.6	\$220.6	\$203.9	\$0.0

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Table 1. Continued

Title	Investigators	Budget (\$000s)							
		2000	2001	2002	2003	2004	2005	2006	2007
<i>Resident Species Projects</i>									
Humpback and Broad Whitefish in Whitefish Lake	USFWS, KNA		\$146.9	\$119.9	\$127.8				
Aniak River Subsistence Fisheries Study	ADFG, KNA		\$61.1		\$29.8				
Lake Minchumina, Telida, Nikolai and Cantwell Fisheries Use	ADFG		\$9.0	\$20.0					
Whitefish Lake Whitefish Telemetry	USFWS				\$109.8	\$109.8			
Whitefish PIT Tags	USFWS					\$40.0			
Whitefish Migratory Behavior Kuskokwim River Watershed	USFWS, KNA							\$162.7	\$173.1
Lower Kuskokwim Non-Salmon Harvest and TEK	ADFG, AVCP							\$86.1	\$91.8
Subtotal		\$0.0	\$217.0	\$139.9	\$157.6	\$109.8	\$149.8	\$248.8	\$264.9
Total Kuskokwim Region Monitoring Program		\$330.9	\$1,975.9	\$1,306.4	\$1,042.9			\$1,856.0	\$482.6

funds that would be used to hire local residents; and matching funds from investigating agencies and organizations (Tables 2 and 3).

AVAILABLE FUNDS

Federal Subsistence Board guidelines direct initial distribution of funds among regions and data types. For 2007, approximately \$778,000 is available for funding new projects in the Kuskokwim Region. All of this is available for stock status and trends projects since no harvest monitoring and traditional ecological knowledge projects are being considered for funding.

PRIORITIES FOR FUNDING

After reviewing the six investigation plans, the Technical Review Committee recommended funding all of them and prioritized them in the following descending order:

07-303	Kuskokwim Salmon Age-Sex-Length Assessment	\$ 81,440
07-304	Tatlawiksuk River Salmon Weir	\$154,665
07-306	Kwethluk River Salmon Weir	\$168,000
07-305	Kanektok — Goodnews River Salmon Weir	\$108,900
07-307	Tuluksak River Salmon Weir	\$142,000
07-302	Kuskokwim River Chum Salmon Run Reconstruction	\$ 49,015

The six projects recommended for funding would provide information concerning in-season subsistence catch monitoring, and development of a run reconstruction and forecasting model for chum salmon stocks. Brief project descriptions follow (see Executive Summaries for more details):

07-303 Kuskokwim Salmon Age-Sex-Length Assessment. This project will provide continuation funding for the processing, analysis, quality control, distribution and archiving of age, sex and length data from over 30,000 salmon that are routinely collected at fisheries and escapement monitoring projects throughout the region. The proposed work addresses an important research and monitoring need by supporting standardization and quality control for basic biological data for the management of Kuskokwim salmon stocks.

07-304 Tatlawiksuk River Salmon Weir. This project will continue operation of the Tatlawiksuk River weir. The weir is an established and successful cooperative project, and provides valuable escapement and biological sampling data for salmon stocks in an important sub basin of the Kuskokwim River.

07-306 Kwethluk River Salmon Weir. This project will support continued operations at the Kwethluk River weir to enumerate escapements of Chinook, sockeye, chum and coho salmon. Kwethluk River salmon stocks are harvested by a large lower river subsistence fishery, and pass through a commercial fishing district between the Kuskokwim and the Kwethluk River mouths.

07-305 Kanektok — Goodnews River Salmon Weirs. The Goodnews and Kanektok River weirs are established and successful monitoring projects that provide the primary escapement and run strength data used to ensure sustainability of Kuskokwim Bay subsistence fisheries in the Goodnews and Kanektok Rivers. These projects also serve as important platforms for ongoing Dolly Varden char research being conducted by the Togiak NWR.

Table 2. Kuskokwim Region project costs, by organization, for investigation plans submitted to the Fisheries Resource Monitoring Program for funding consideration in 2007. All investigation plans were for stock status and trends projects.

Project Number	Title	Project Costs (\$000s)			
		AK Native	State	Federal	Other
07-302	Kuskokwim River Chum Salmon Run Reconstruction		\$12.4		\$36.6
07-303	Kuskokwim River Salmon Age-Sex-Length Assessment		\$81.4		
07-304	Tatlawiksuk River Salmon Weir	\$74.5	\$80.2		
07-305	Kanektok-Goodnews River Salmon & Dolly Varden Weirs		\$100.9	\$8.0	
07-306	Kwethluk River Salmon Weir	\$75.7		\$100.4	
07-307	Tuluksak River Salmon Weir	\$52.4		\$101.6	

Table 3. Kuskokwim Region local hire and matching funds for investigation plans submitted to the Fisheries Resource Monitoring Program for funding consideration in 2007. Abbreviations used are: ADFG=Alaska Department of Fish and Game, BC=Bue Consulting, USFWS=U.S. Fish and Wildlife Service.

Project Number	Lead	Title	Funding (\$000s)	
			Local Hire	Matching
07-302	BC	Kuskokwim River Chum Salmon Run Reconstruction		\$6.5
07-303	ADFG	Kuskokwim River Salmon Age-Sex-Length Assessment	\$10.4	\$43.0
07-304	ADFG	Tatlawiksuk River Salmon Weir	\$26.6	\$79.5
07-305	ADFG	Kanektok-Goodnews River Salmon and Dolly Varden Weirs		\$145.9
07-306	USFWS	Kwethluk River Salmon Weir	\$45.9	\$80.0
07-307	USFWS	Tuluksak River Salmon Weir	\$37.3	\$80.0

Table 4. Funding recommendations by the Technical Review Committee (TRC) for Kuskokwim Region projects, 2007 Fisheries Resource Monitoring Program

Project Number	Title	TRC	Requested Budget (\$000)		
			2007	2008	2009
07-302	Kuskokwim River Chum Salmon Run Reconstruction	Yes	\$49.0	\$56.9	\$0.0
07-303	Kuskokwim River Salmon Age-Sex-Length Assessment	Yes	\$81.4	\$96.0	\$99.5
07-304	Tatlawiksuk River Salmon Weir	Yes	\$154.7	\$161.8	\$176.1
07-305	Kanektok-Goodnews River Salmon & Dolly Varden Weirs	Yes	\$108.9	\$101.0	\$104.6
07-306	Kwethluk River Salmon Weir	Yes	\$176.2	\$187.9	\$190.4
07-307	Tuluksak River Salmon Weir	Yes	\$154.1	\$159.6	\$173.6
Total			\$724.3	\$763.2	\$744.2
Funding Guideline			\$778.0		
TRC Recommendation			\$724.3	\$763.2	\$744.2

07-307 Tuluksak River Salmon Weir. This project will support continued operations at the Tuluksak River weir to enumerate escapements of Chinook, sockeye, chum, and coho salmon.

07-302 Kuskokwim River Chum Salmon Run Reconstruction. This project will support the analysis of existing data from 1976 through 2007 to estimate spawning and total abundance of chum salmon in the Kuskokwim River using a statistical model for combining multiple data sources. In addition, the spawner-recruit relationship of Kuskokwim River chum salmon will be described to assess the influence of parental escapement abundance on variations in return.

RECOMMENDATIONS FOR FUNDING

The Technical Review Committee recommends funding all six projects under consideration in the Kuskokwim Region at a cost of \$724,300, well within the funding guideline for the region. The six projects comprise a strong Monitoring Plan for this region that addresses strategically important informational needs, is scientifically sound, and promotes partnerships (Table 4).

EXECUTIVE SUMMARIES

Project Number: 07-302
Project Title: Kuskokwim River Chum Salmon Run Reconstruction
Geographic Region: Kuskokwim
Data Type: Stock Status and Trends
Principal Investigator: Brian Bue, Bue Consulting LLC
Co-Investigator(s): Douglas Molyneaux, ADFG Division of Commercial Fisheries
Cost: 2007: \$49,015 **2008:** \$56,398 **2009:** \$0

RECOMMENDATION: Fund

ISSUE

The status of chum salmon populations within the Kuskokwim River drainage has been of concern in recent years due to apparently low run abundance. The Alaska Board of Fisheries identified Kuskokwim River chum salmon as a stock of concern in November 2000, and enacted regulations to reduce fishing opportunity in all fisheries so more chum salmon could escape to spawn. Reliable information on the numbers of salmon returning by year is essential if researchers are going to understand the mechanisms that drive variation of salmon abundance. This information is a prerequisite to investigating the effects of subsistence management actions, historical exploitation rates, long-term consequences of harvest practices, and the likelihood that projected abundance levels can sustain future harvests.

University of Alaska researchers began to approach the problem of reconstructing past returns by developing a statistical model which incorporated historical information (1976–1999) to estimate the magnitude of past chum salmon returns. The project showed promise but suffered because of insufficient information on salmon escapement. Numerous new projects to enumerate salmon escapement have been in place since the late 1990s and there is a strong chance that this new data will provide the needed resolution to allow the model to work properly. This project will build upon previous work by drawing in information from escapement and mark-recapture projects collected since 1999. Objectives of this project have been identified as high priority information needs by the Kuskokwim Fisheries Resource Coalition in the recent draft Gap Analysis for the Kuskokwim Area Salmon Research Plan.

OBJECTIVES

1. Estimate spawning and total abundance of chum salmon in the Kuskokwim River from 1976 through 2007 using a statistical model for combining multiple data sources.
2. Develop brood year tables for Kuskokwim chum salmon for the years 1976 through 2007 by combining the abundance estimates with estimates of age composition obtained from the subsistence and commercial fisheries as well as escapement enumeration projects.
3. Estimate the stock-recruitment relationship for the Kuskokwim River chum salmon population using the brood table developed in Objective 2 and the Ricker and Beverton-Holt stock-recruitment models.

METHODS

Total chum salmon abundance and escapement into the Kuskokwim River for return years 1976 through 2007 will be estimated using statistical models similar to those developed by University of Alaska researchers for estimating historical chum salmon abundance in the Yukon and Kuskokwim Rivers. Our strategy will use all historic data related to abundance; including: subsistence catch numbers, catch numbers and rates from the inriver commercial fisheries, test fishery catch rates, weir counts, aerial surveys, sonar counts, and mark-recapture estimates. While no one of these abundance indices is likely to provide a reliable estimate of historical drainage wide abundance or escapement, when used in aggregate, they should provide a reasonably accurate estimate. We will combine these indices of abundance using multivariate statistical tools and a maximum likelihood estimation framework. The abundance and escapement estimates will be combined with all available data on salmon age composition to estimate brood tables for the Kuskokwim River chum salmon stock. Brood table information will then be used to estimate the stock-recruitment relationship for the drainage.

PARTNERSHIPS/CAPACITY BUILDING

Organizations that provide data processed by this project include Kuskokwim Native Association, Organized Village of Kwethluk, Orutsararmiut Native Council, Takotna Tribal Council, Tuluksak Traditional Council, ADFG Commercial Fisheries Division, and U.S. Fish and Wildlife Service (Kenai Fish and Wildlife Field Office; Yukon Delta and Togiak National Wildlife Refuges). In December 2005, this project was reviewed and supported by the Kuskokwim Fisheries Resources Coalition, a group that includes representatives from the ADFG Subsistence Division, ADFG Commercial Fisheries Division, the Association of Village Council Presidents, Kuskokwim Native Association, Orutsararmiut Native Council, Yukon Delta National Wildlife Refuge, USFWS Fisheries Information Services, and others.

JUSTIFICATION

The investigators propose analysis of existing data from 1976 through 2007 to estimate spawning and total abundance of chum salmon in the Kuskokwim River using a statistical model for combining multiple data sources; and to describe the spawner-recruit relationship of Kuskokwim River chum salmon assessing the influence of parental escapement abundance on variations in return. The proposed work would address an important research question and potentially could introduce innovative methodologies and management tools for Kuskokwim River chum salmon fisheries.

Project Number: 07-303
Project Title: Kuskokwim Salmon Age-Sex-Length Assessment
Geographic Region: Kuskokwim
Data Type: Stock Status and Trends
Principal Investigator: Douglas Molyneaux ADFG Division of Commercial Fisheries

Cost: 2007: \$81,440 **2008:** \$96,010 **2009:** \$99,510

RECOMMENDATION: Fund

ISSUE

A number of projects have been funded through Fisheries Information Service to monitor salmon escapements and subsistence harvest, and most include collection of samples used to estimate salmon age, sex, and length (ASL) compositions. In 2005, ASL data were collected from 30,000 escapement samples, commercial and subsistence harvests, and the Bethel test fishery. This project provides the support required to process these ASL samples, compile the information, and provide consistent analysis of results to managers, project leaders and the public. The ASL information is used in a variety of ways including forecasting future run abundance, assessing effects of harvest methods, determining spawner-recruit relationships, studying causes of variation in freshwater and marine growth, and assessing many other short-term and long-term population trends.

OBJECTIVES

1. Estimate the age-sex-length (ASL) composition of Chinook, chum, and coho salmon samples collected from fisheries, escapements, and other Monitoring Program funded projects in the Kuskokwim Area.
2. Standardize ASL sampling throughout the Kuskokwim Area by providing sampling kits and instructions for measuring salmon length, sex determination, and collection of scales to all projects collecting ASL data in the Kuskokwim Area.
3. Standardize age determination of Kuskokwim Area salmon from scales by processing all collected scales at a central lab in Anchorage ADF&G with scale-ageing standardization across AYK.
4. Provide electronic and physical sample storage for project ASL data by loading ALS data into a central database and filing physical records (scales, acetates, data collection forms) in Anchorage (merging with data collected since 1961).
5. Provide access ASL data to researchers and public through responding to data requests for physical and electronic records of age and growth.

METHODS

Participants will deliver salmon ASL samples to the principal investigator. Samples will be from subsistence and commercial fisheries, as well as Kuskokwim River Region stock status and trends projects operated by various Federal, State and Tribal groups. Salmon scales will be manually processed

and aged, and ASL data will be electronically processed with standard computer programs to provide summaries of harvest and escapements partitioned into age, sex, and length categories. A local hire fish and wildlife technician will be employed through Work Place Alaska hiring procedures to assist with ASL processing during the summer months. Summary information will be provided to various contributing project leaders and to participating subsistence harvest samplers.

PARTNERSHIP/CAPACITY BUILDING

The *Kuskokwim Salmon Age-Sex-Length Assessment* project is integrated into several Monitoring Program funded projects. Some of the organizations that will directly benefit from the project include ADFG Commercial Fisheries Division, ADFG Sport Fish Division, ADFG Subsistence Division, Association of Village Council Presidents, Kuskokwim Native Association, Organized Village of Kwethluk, Orutsarmiut Native Council, Native Village of Kwinhagak, Takotna Tribal Council, Tuluksak Traditional Council, Kenai Fish and Wildlife Field Office, Togiak National Wildlife Refuge, and Yukon Delta National Wildlife Refuge. All of these groups have projects that include the collection of salmon ASL samples and depend on ADFG Commercial Fisheries Division for processing samples.

JUSTIFICATION

The proposed work addresses an important research and monitoring needed by supporting standardization and quality control for the collection, analysis and documentation of analysis techniques for use by the fishery managers. This information is used to monitor sex, age and size composition of commercial, subsistence fisheries and escapement projects; develop brood tables to assess management actions, develop run strength outlooks, and describe spawner recruit relationships.

Project Number: 07-304
Project Title: Tatlawiksuk River Salmon Weir
Geographic Region: Kuskokwim
Data Type: Stock Status and Trends
Principal Investigator: Douglas Molyneaux,, ADFG Division of Commercial Fisheries
Co-Investigator(s): David Orabutt, Kuskokwim Native Association
Dan Costello, ADFG

Cost: 2007: \$154,665 **2008:** \$161,777 **2009:** \$176,134

RECOMMENDATION: **Fund**

ISSUE

Tatlawiksuk River salmon contribute to subsistence, commercial, and recreational fisheries within the Yukon Delta National Wildlife Refuge. The status of salmon populations within the drainage, including Tatlawiksuk River, has been of concern due to low run abundance. Tatlawiksuk River weir is one of several projects used to develop reliable estimates of abundance, run timing, stock structure, productivity, and carrying capacity of salmon stocks in the Kuskokwim Region, which is identified by Office of Subsistence Management as a priority information need. The project provides fundamental escapement information necessary to facilitate in-season management decisions and to assess trends in salmon populations. This project is essential as a platform for several other projects and for developing escapement goals as is currently in consideration. This project also incorporates substantial capacity building and outreach components.

Salmon escapements to Tatlawiksuk River weir have been monitored successfully since 1999. Information from this project has become integrated into the annual management process, by providing insights into escapement and stock specific run timing through the fishery. The escapement age, sex, and length information collected at Tatlawiksuk River provides part of the context needed to assess the impacts of subsistence harvest practices (*Age, Sex, and Length Composition of Lower Kuskokwim River Subsistence Chinook Harvest*, FIS #04-354).

OBJECTIVES

1. Determine daily and total annual Chinook, chum, and coho salmon escapements to Tatlawiksuk River from 15 June to 20 September;
2. Estimate age, sex, and length composition of annual Chinook, chum, and coho salmon escapements;
3. Monitor habitat variables including daily water temperature, water level, and stream discharge;
4. Provide mentorship and administer education curriculum to Kuskokwim Native Association high school interns; and,
5. Serve as a platform to facilitate current and future fisheries research projects.

METHODS

Investigators will install a resistance board weir on the lower Tatlawiksuk River. A live trap will be used to sample salmon for scales, sex and length information, and for tag recovery. Investigators will also record daily water temperature, water level, and weather conditions. A local technician hired by the Kuskokwim Native Association will operate the project along with a lead crew member provided by ADFG. The project will also serve as a platform to host students from the Kuskokwim Native Association Student Internship Program.

PARTNERSHIP/CAPACITY BUILDING

Kuskokwim Native Association and ADFG have been cooperators on salmon escapement enumeration projects on the George and Tatlawiksuk Rivers since 1996 and 1998, respectively. Oversight of field operations is shared between the Kuskokwim Native Association and ADFG Division of Commercial Fisheries. ADFG takes the lead in data management, data analysis and reporting; however, more of this responsibility is expected to shift to the Kuskokwim Native Association. This budget also includes approximately \$25,000 annual funding support for ADFG senior scientists, and \$16,000 annual funding support for the Kuskokwim Native Association senior scientists.

JUSTIFICATION

The Tatlawiksuk River weir is an established and successful cooperative project operated by Kuskokwim Native Association and ADFG. The project provides valuable escapement and biological sampling data for salmon stocks in an important sub basin of the Kuskokwim River, promotes local involvement, and develops the capacity of Kuskokwim Native Association to monitor fish populations.

Project Number: 07-305
Project Title: Kanektok — Goodnews River Salmon Run Assessment Projects
Geographic Region: Kuskokwim
Data Type: Stock Status and Trends
Principal Investigator: John Linderman, ADFG Division of Commercial Fisheries
Co-Investigator(s): Edward Mark, Native Village of Kwinhagak
Mark Lisac, USFWS Togiak National Wildlife Refuge

Cost: 2007: \$108,900 **2008:** \$101,000 **2009:** \$104,600

RECOMMENDATION: Fund

ISSUE

This proposal will fund the operations of two resistance-board weirs currently utilized on the Kanektok and Goodnews Rivers (funding here is requested to extend the operational period for the Goodnews River weir to better enumerate coho salmon stocks). Both of these projects enumerate all five species of salmon found in Alaska, as well as, Dolly Varden. Escapement information and biological data collected at these projects are valuable for setting escapement objectives, determining run timing, assessing the age structure of the returns, and enumerating adult salmon spawners.

OBJECTIVES

1. Enumerate daily and annual total passage of Chinook, chum, sockeye, and coho salmon, and Dolly Varden through the Kanektok and Middle Fork Goodnews River weirs.
2. Describe the run-timing or proportional daily passage of Kanektok River Chinook, chum, sockeye, and coho salmon and Middle Fork Goodnews River coho salmon.
3. Estimate the sex, age, and length composition of Kanektok River Chinook, chum, sockeye, and coho salmon escapements and Middle Fork Goodnews River coho salmon escapement such that simultaneous 90% confidence intervals have maximum width of 0.20.
4. Monitor environmental variables at the project sites such as relative water level, discharge rate, and water temperature.

METHODS

A resistance-board weir will be installed in the Kanektok and Goodnews Rivers to enumerate passage of the five species of salmon found in Alaska and Dolly Varden. The projects will also act as a platform for the collection of biological samples (age-sex-length, genetics, scales, etc.). This information will be used to assess the returns to these systems.

PARTNERSHIPS/CAPACITY BUILDING

Goodnews weir will be staffed by two ADFG Fish and Wildlife Technicians and one local hire USFWS Fisheries Technician.

The Kanektok River weir is operated cooperatively by ADFG, Native Village of Kwinhagak, and USFWS Togiak National Wildlife Refuge.

Regular consultations between ADFG, the Native Village of Kwinhagak, USFWS, CVRF and local stake holders will occur throughout the year to coordinate logistics, discuss results, and exchange ideas.

JUSTIFICATION

The Goodnews and Kanektok River weirs are established and successful monitoring projects that provide the primary escapement and run strength data used to ensure sustainability of Kuskokwim Bay subsistence fisheries and conserve fisheries stocks in the Goodnews and Kanektok Rivers. This proposal would support continued operations of both the Kanektok and Goodnews River weirs for a complete field season enumerating escapements of Chinook, sockeye, chum and coho salmon. These projects also serve as important platforms for ongoing Dolly Varden char research being conducted by the Togiak NWR.

Project Number: 07-306
Project Title: Kwethluk River Salmon Weir
Geographic Region: Kuskokwim
Data Type: Stock Status and Trends
Principal Investigator: Ken Harper, USFWS Kenai Fish and Wildlife Field Office
Co-Investigator(s): Native Village of Kwethluk

Cost: 2007: \$176,157 **2008:** \$187,863 **2009:** \$190,403

RECOMMENDATION: Fund

ISSUE

Management of Kuskokwim Area salmon fisheries is complex because of annual variability in run size and timing, harvesting of mixed stocks, overlapping runs of multiple species, allocation issues, and the immense size of the Kuskokwim River drainage. Fishery managers need salmon escapement data from representative rivers that contribute to this complex mixed stock subsistence fishery. Investigators will collect data on chum, Chinook, sockeye, and coho salmon.

OBJECTIVES

1. Enumerate the daily passage of Chinook, chum, sockeye, and coho salmon and resident fish species through the weir.
2. Describe the run-timing or proportional daily passage of Chinook, chum, pink, sockeye, and coho salmon through the weir.
3. Estimate the weekly sex and age composition of Chinook, chum, and coho salmon such that simultaneous 90% confidence intervals have a maximum width of 0.20.
4. Estimate the mean length of Chinook, chum and coho salmon by sex and age.
5. Enumerate the number of Chinook, chum, pink, sockeye, and coho salmon carcasses that wash down onto the weir each day.
6. Monitor passage of any salmon (Chinook, chum, sockeye and coho salmon) that may be tagged in middle Kuskokwim River mark recapture studies.

METHODS

Investigators will install a resistance board weir across the Kwethluk River, 78 river kilometers upstream from the Kuskokwim River. Salmon will be counted as they pass through a counting chute located on a live trap. Weekly samples of length, sex, and scales will be collected from fish passing up stream, and gill net marks will be noted before releasing sampled fish up-stream from the weir. Local technicians hired by the Organized Village of Kwethluk will be trained by the Kenai Fish and Wildlife Field Office in weir operations and biological sample collection methodology.

PARTNERSHIP/CAPACITY BUILDING

Capacity building will continue, as the USFWS mentors and trains 3–5 village technicians in project operations. This project reaches the cooperation level of capacity building (level 5) and potentially could fully become a partnership of equals between the USFWS and the Organized Village of Kwethluk. We have developed a formal agreement that has been signed by both parties committing the Service to making it a priority to train village personnel for crew and possible leaders. Under this signed agreement, the village has agreed to recruiting technicians with the understanding that they will be expected to follow a set work schedule to ensure proper function of the project. The village will also have technicians available to assist with and learn the process of installation and removal of the weir. They will participate in the operation and collection of escapement data. This will provide an educational basis for employees and the village government to further their understanding of the management of lower Kuskokwim River commercial and subsistence fisheries.

In partnership with the Association of Village Council Presidents and their Partners Biologist the Kenai Kenai Fish and Wildlife Field Office office is currently working with Association of Village Council Presidents and the Yukon Delta National Wildlife Refuge and planning for hosting science camp students at the weir in 2006 and beyond. The Kenai Fish and Wildlife Field Office will provide biologists to mentor students when they spend time at the fish weir. It is expected that the Partners Biologist will be available to work at the weir when needed to expand their understanding of the weir. This educational mentoring will be crucial in developing future village weir technicians, crew leaders, and biologists at these projects.

JUSTIFICATION

The Kwethluk River weir is an established and successful monitoring project that provides escapement and run strength data used to ensure sustainability of subsistence fisheries and conserve fisheries stocks in the Kwethluk River. There is a strong Federal Nexus with the Yukon Delta National Wildlife Refuge; and the Kwethluk River salmon stocks are harvested by a large lower river subsistence fishery, and pass through a commercial fishing district between the Kuskokwim and the Kwethluk River mouths.

Project Number: 07-307
Project Title: Salmon Run Timing and Abundance in the Tuluksak River
Geographic Region: Kuskokwim
Data Type: Stock Status and Trends
Principal Investigator: Ken Harper, USFWS Kenai Fish and Wildlife Field Office
Co-Investigator(s): Tuluksak Native Community

Cost: 2007: \$154,061 **2008:** \$159,574 **2009:** \$173,610

RECOMMENDATION: Fund

ISSUE

Management of Kuskokwim Area salmon fisheries is complex because of annual variability in run size and timing, harvesting of mixed stocks, overlapping runs of multiple species, allocation issues, and the immense size of the Kuskokwim River drainage. Fishery managers need salmon escapement data from representative rivers that contribute to this complex mixed stock subsistence fishery. Investigators will collect data on chum, Chinook, sockeye, and coho salmon.

OBJECTIVES

1. Enumerate the daily passage of Chinook, chum, sockeye, and coho salmon and resident fish species through the weir.
2. Describe the run-timing or proportional daily passage of Chinook, chum, pink, sockeye, and coho salmon through the weir.
3. Estimate the weekly sex and age composition of Chinook, chum, and coho salmon such that simultaneous 90% confidence intervals have a maximum width of 0.20.
4. Estimate the mean length of Chinook, chum and coho salmon by sex and age.
5. Enumerate the number of Chinook, chum, pink, sockeye, and coho salmon carcasses that wash down onto the weir each day.
6. Monitor passage of any salmon (Chinook, chum, sockeye and coho salmon) that may be tagged in middle Kuskokwim River mark recapture studies.

METHODS

Investigators will install a resistance board weir across the Tuluksak River 49 river kilometers (rkm) upstream from the confluence with the Kuskokwim River. Salmon will be counted as they pass through a counting chute located on a live trap. Weekly samples of length, sex, and scales will be collected from fish passing up stream, and gill net marks will be noted before releasing sampled fish up-stream from the weir. Local technicians hired by the Tuluksak Native Community will be trained by the Kenai Fish and Wildlife Field Office in weir operations and biological sample collection methodology.

PARTNERSHIP/CAPACITY BUILDING

Capacity building will continue, as the USFWS mentors and trains 3–5 village technicians in project operations. This project reaches the cooperation level of capacity building (level 5) and potentially could fully become a partnership of equals between the USFWS and the Tuluksak Native Community. We have developed a formal agreement that has been signed by both parties committing the Service to making it a priority to train village personnel for crew and possible leaders. Under this signed agreement, the village has agreed to recruiting technicians with the understanding that they will be expected to follow a set work schedule to ensure proper function of the project. The village will also have technicians available to assist with and learn the process of installation and removal of the weir. They will participate in the operation and collection of escapement data. This will provide an educational basis for employees and the village government to further their understanding of the management of lower Kuskokwim River commercial and subsistence fisheries.

In partnership with the Association of Village Council Presidents and their Partners Biologist the Kenai Fish and Wildlife Field Office is currently working with the Association of Village Council Presidents and the Yukon Delta National Wildlife Refuge and planning for hosting science camp students at the weir in 2006 and beyond. The Kenai Fish and Wildlife Field Office will provide biologists to mentor students when they spend time at the fish weir. It is expected that the Partners Biologist will be available to work at the weir when needed to expand their understanding of the weir. This educational mentoring will be crucial in developing future village weir technicians, crew leaders, and biologists at these projects.

JUSTIFICATION

The Tuluksak River weir is an established and successful monitoring project that provides the escapement and run strength data used to ensure sustainability and conservation of fisheries stocks in the Kuskokwim River. There is a strong federal nexus with the Yukon Delta National Wildlife Refuge; and the Tuluksak River salmon stocks are harvested by a large lower river subsistence fishery, and pass through a commercial fishing district between the Kuskokwim and the Kwethluk river mouths.